

REMARKS

The Office Action mailed August 16, 2007, has been carefully reviewed and the following remarks and foregoing amendments have been made in consequence thereof.

Claims 6, 7, 9-12, and 14-16 are pending in this application. Claims 6, 7, 9-12, and 14-16 stand rejected. Claims 1-5, 8, 13, and 17 have been canceled.

The rejection of Claims 6-7, 9-12, and 14-16 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative as being obvious over, Bartos, et al. (U.S. Patent No. 4,059,123) is respectfully traversed.

Bartos, et al. describe a self-contained turbine engine cleaning and preservation unit (10). Unit (10) includes a water reservoir (18), a preservative reservoir (20), a reservoir (22) and a solvent reservoir (24). Water reservoir (18) contains water, preservative reservoir (20) contains preservation solution for protecting engine components from rust, reservoir (22) contains cleaner, and reservoir (24) contains solvent. A ring assembly (96) is configured to inject fluids into a gas turbine engine. Ring assembly (96) includes two arcuate tube sections (222 and 224) having threaded fittings on one end which allow attachment to a t-section (226). T-section (226) attaches to a high pressure hose (94) that is coupled in flow communication with unit (10). The second end of tube sections (222 and 224) are stopped by means of end caps (228 and 230). A plurality of holes (232) are defined within front face of tubes (222 and 224). Holes (232) allow liquid to be discharged in a direction that is substantially perpendicular to the plane of ring assembly (96). Notably, Bartos, et al. do not describe nor suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter that is dislodged by the first liquid from the engine.

Claim 6 recites an apparatus for a gas turbine engine, wherein the apparatus comprises a washing system comprising “a pump in flow communication with a plurality of spray nozzles coupled to a ring manifold, said plurality of spray nozzles are circumferentially spaced about the gas turbine engine and are oriented to discharge at least one of a first fluid and a second fluid radially inward into the gas turbine engine from the ring manifold, the first

fluid contained within a first reservoir, the second fluid contained within one of the first reservoir and a second reservoir, said washing system configured to inject the first fluid and the second fluid into the gas turbine engine, wherein one of the first and second fluids comprises an anti-static liquid that facilitates reducing a rate of formation of particulate matter within the gas turbine engine, the first fluid configured to be injected into the engine while the engine is rotated to facilitate removing particulate matter from the engine.”

Bartos et al. do not describe nor suggest an apparatus for a gas turbine engine as is recited in Claim 6. Specifically, Bartos et al. do not describe nor suggest an apparatus for a gas turbine engine including a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, Bartos et al. merely describe a ring assembly in flow communication with a gas turbine engine cleaning unit. Accordingly, for at least the reasons set forth above, Claim 6 is submitted to be patentable over Bartos et al.

Claims 7 and 9-11 depend from independent Claim 6. When the recitations of Claims 7 and 9-11 are considered in combination with the recitations of Claim 6, Applicants submit that dependent Claims 7 and 9-11 likewise are patentable over Bartos et al.

Claim 12 recites a gas turbine engine washing system configured to reduce particulate matter within the gas turbine engine, the gas turbine engine including a compressor, wherein the washing system comprises “a plurality of spray nozzles coupled to a ring manifold, said plurality of spray nozzles are circumferentially spaced about the gas turbine engine and are oriented to discharge at least one of a first fluid and a second fluid radially inward into the gas turbine engine from the ring manifold, the first liquid contained within a first reservoir, the second fluid contained within one of the first reservoir and a second reservoir, the plurality of nozzles coupled in flow communication with at least one of said first and second reservoirs and for injecting the first and second fluids into the gas turbine engine upstream from said compressor, wherein one of the first and second fluids is an anti-static liquid that facilitates reducing electrostatic attraction within the gas turbine engine, the first fluid configured to be injected into the engine while the engine is rotated to facilitate removing particulate matter from the engine.”

Bartos et al. do not describe nor suggest a gas turbine engine washing system configured to reduce particulate matter within the gas turbine engine as is recited in Claim 12. Specifically, Bartos et al. do not describe nor suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, Bartos et al. merely describe a ring assembly in flow communication with a gas turbine engine cleaning unit. Accordingly, for at least the reasons set forth above, Claim 12 is submitted to be patentable over Bartos et al.

Claims 14-16 depend from independent Claim 12. When the recitations of Claims 14-16 are considered in combination with the recitations of Claim 12, Applicants submit that dependent Claims 14-16 likewise are patentable over Bartos, et al.

For at least the reasons set forth above, Applicants respectfully request that the Section 102(b) rejection of Claims 6-7, 9-12, and 14-16 be withdrawn.

The rejection of Claims 6-7, 9-12, and 14-16 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over, Beck et al. (U.S. Patent No. 5,944,483), as evidenced by Hodgens, II et al. (U.S. Patent No. 4,713,120) and Bartos is respectfully traversed.

Beck et al. describe a method for wet cleaning of the nozzle rings of exhaust-gas turbocharger turbines that is based on thermal shock of the contaminants. The method includes the steps of injecting water in repeated, relatively small amounts, into an exhaust duct immediately upstream of the nozzle ring. A delay between injections allows the nozzle ring to reheat to operating temperature so that each water injection causes a thermal shock. Notably, Beck, et al. do not describe nor suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter that is dislodged by the first liquid from the engine.

Hodgens, II et al. describe a composition and method for removing deposits (10) from internal components (24) of a gas turbine engine (18). Specifically, Hodgens, II et al. describe a portable wash cart (11) for cleaning a portion of engine (18). Wash cart (11) includes a cleaning composition container (12) including a cleaning composition (15), and a rinse solution container (13) including a rinsing solution (16). Cart (11) further includes a

flexible hose (23) that includes a single spray probe (20). The probe (20) is inserted through a boroscope port (21) to inject solutions (15 and 16) into engine (18). Cleaning composition (15) is formed from an aqueous solution, and is injected into a typical airflow path to loosen deposits (10) formed along the flowpath within engine (18). Rinsing solution (16) is injected into engine (18) to facilitate removing both the cleaning composition (15) and loosened deposits. Notably, Hodgens, II et al. do not describe nor suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter that is dislodged by the first liquid from the engine.

Bartos, et al. is described above.

Claim 6 is recited above.

None of Beck, et al., Hodgens, II et al., or Bartos, et al., considered alone or in combination, describe nor suggest an apparatus for a gas turbine engine as is recited in Claim 6. Specifically, none of Beck, et al., Hodgens, II et al., or Bartos, et al., considered alone or in combination, describe nor suggest an apparatus for a gas turbine engine including a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, Beck et al. merely describe a method for wet cleaning of the nozzle rings of exhaust-gas turbocharger turbines that is based on thermal shock of the contaminants, Hodgens, II et al. merely describe a portable wash cart for cleaning a portion of an engine, and Bartos et al. merely describe a ring assembly in flow communication with a gas turbine engine cleaning unit. Accordingly, for at least the reasons set forth above, Claim 6 is submitted to be patentable over Beck, et al., Hodgens, II et al., and Bartos et al., considered alone or in combination.

Claims 7 and 9-11 depend from independent Claim 6. When the recitations of Claims 7 and 9-11 are considered in combination with the recitations of Claim 6, Applicants submit that dependent Claims 7 and 9-11 likewise are patentable over Beck et al., Hodgens, II et al., and Bartos et al., considered alone or in combination.

Claim 12 is recited above.

None of Beck, et al., Hodgens, II et al., or Bartos, et al., considered alone or in combination, describe nor suggest a gas turbine engine washing system configured to reduce particulate matter within the gas turbine engine as is recited in Claim 12. Specifically, none of Beck, et al., Hodgens, II et al., or Bartos, et al., considered alone or in combination, describe or suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, Beck et al. merely describe a method for wet cleaning of the nozzle rings of exhaust-gas turbocharger turbines that is based on thermal shock of the contaminants, Hodgens, II et al. merely describe a portable wash cart for cleaning a portion of an engine, and Bartos et al. merely describe a ring assembly in flow communication with a gas turbine engine cleaning unit. Accordingly, for at least the reasons set forth above, Claim 12 is submitted to be patentable over Beck, et al., Hodgens, II et al., and Bartos et al., considered alone or in combination.

Claims 14-16 depend from independent Claim 12. When the recitations of Claims 14-16 are considered in combination with the recitations of Claim 12, Applicants submit that dependent Claims 14-16 likewise are patentable over Beck, et al., Hodgens, II et al., and Bartos et al., considered alone or in combination.

For at least the reasons set forth above, Applicants respectfully request that the Section 102(b) and Section 103(a) rejections of Claims 6-7, 9-12, and 14-16 be withdrawn.

The rejection of Claims 6-7, 9-12, and 14-16 under 35 U.S.C. §103(a) as being unpatentable over McDermott et al. (U.S. Patent 5,273,395) in view of Hodgens, II et al. is respectfully traversed.

McDermott describes a washing system using a plurality of spray nozzles circumferentially spaced around a ring manifold. Notably, McDermott does not describe or suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter that is dislodged by the first liquid from the engine.

Hodgens, II et al. is described above.

Claim 6 is recited above.

Neither McDermott nor Hodgens, II et al., considered alone or in combination, describe or suggest an apparatus for a gas turbine engine as recited in Claim 6. More specifically, neither McDermott nor Hodgens, II et al., considered alone or in combination, describe or suggest describe nor suggest an apparatus for a gas turbine engine including a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, in contrast to the present invention, McDermott describes a plurality of spray nozzles circumferentially spaced around a ring manifold, and Hodgens, II et al. describe a portable wash cart for cleaning a portion of an engine. Accordingly, for at least the reasons set forth above, Claim 6 is submitted to be patentable over McDermott in view of Hodgens, II et al.

Claims 7 and 9-11 depend from independent Claim 6. When the recitations of Claims 7 and 9-11 are considered in combination with the recitations of Claim 6, Applicants submit that dependent Claims 7 and 9-11 likewise are patentable over McDermott in view of Hodgens, II et al.

Claim 12 is recited above.

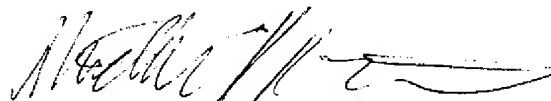
Neither McDermott nor Hodgens, II et al., considered alone or in combination, describe or suggest a gas turbine engine washing system as is recited in Claim 12. More specifically, neither McDermott nor Hodgens, II et al., considered alone or in combination, describe nor suggest a washing system, wherein a first fluid is configured to be injected into an engine while the engine is rotated to facilitate removing particulate matter from the engine. Rather, in contrast to the present invention, McDermott describes a plurality of spray nozzles circumferentially spaced around a ring manifold, and Hodgens, II et al. describe a portable wash cart for cleaning a portion of an engine. Accordingly, for at least the reasons set forth above, Claim 12 is submitted to be patentable over McDermott in view of Hodgens, II et al.

Claims 14-16 depend from independent Claim 12. When the recitations of Claims 14-16 are considered in combination with the recitations of Claim 12, Applicants submit that dependent Claims 14-16 likewise are patentable over Beck et al.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 6-7, 9-12, and 14-16 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael J.A. Leinauer", with a long horizontal flourish extending to the right.

Michael J.A. Leinauer
Registration No. 55,795
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070